



DECLARATION

I, Takahiro SHIMIZU of Ark Mori Building, 13F, 12-32, Akasaka 1-chome, Minato-ku, Tokyo 107, Japan, do hereby certify that I am conversant with the English and Japanese languages and am a competent translator thereof, and I further certify that to the best of my knowledge and belief the following is a true and correct translation made by me of the Japanese specification JP2000-267954 as filed attached hereto.

Signed this 8th day of April 8, 2005

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke, positioned above a solid horizontal line.

Takahiro SHIMIZU



[Document name] Specification

[Title of the invention]

VOICE RECOGNITION UNIT AND METHOD THEREOF

[claim scope of the invention]

5        [Claim 1]        A voice recognition unit, comprising:  
         plural speech recognition dictionaries mutually  
         hierarchically related;

         extracting means that extracts a desired dictionary  
         out of the speech recognition dictionaries as a list  
10      of queuing words;

         selecting means that selects a desired dictionary  
         out of the speech recognition dictionaries;

         storing means that stores the dictionary selected  
         by the selecting means as a list of queuing words at  
15      a higher-order hierarchy than a hierarchy set beforehand  
         together with the normal dictionary extracting by the  
         extracting means; and

         recognizing means that recognizes input voice by  
         comparing the input voice and the list of queuing words  
20      stored in the storing means.

         [Claim 2]        A voice recognition unit according  
         to Claim 1, comprising as the speech recognition  
         dictionaries:

         a      classification      dictionary      storing      the  
25      classification names of institutions; and

an institution dictionary storing the names of institutions which belong to a type of institutions every type.

[Claim 3] A voice recognition unit according to Claim 1 or 2, comprising as the speech recognition dictionaries:

an area dictionary storing area names; and

an institution dictionary storing the names of institutions existing in any area every area.

10 [Claim 4] A voice recognition unit according to Claim 2 or 3, wherein:

the selecting means selects the institution dictionary as a desired dictionary.

[Claim 5] A voice recognition unit according to Claim 4, wherein:

the extracting means extracts a dictionary at a low-order hierarchy of recognized voice as queuing words; and

the extracting means extracts a dictionary which belongs to a dictionary selected by the selecting means and which is located at a low-order hierarchy of the recognized voice extracts as queuing words.

[Claim 6] A voice recognition method, wherein:

it is used for a voice recognition unit having plural speech recognition dictionaries mutually

hierarchically related; and

processing for recognizing input voice is executed  
using dictionaries classified according to at least  
one narrowing-down condition set by a user beforehand  
5 together with a dictionary for narrowing down at a  
high-order hierarchy as objects of recognition.

[Claim 7] A voice recognition method according  
to Claim 6, wherein:

dictionaries classified according to at least one  
10 narrowing-down condition set by a user beforehand are  
dictionaries the frequency of use of which is high.

[Claim 8] A voice recognition unit, comprising:  
plural speech recognition dictionaries mutually  
hierarchically related;

15 extracting means that extracts a desired dictionary  
out of the speech recognition dictionaries as a list  
of queuing words;

storing means that stores the list of queuing words  
in the dictionary extracted by the extracting means;

20 and

recognizing means that recognizes input voice by  
comparing the input voice and the list of queuing words  
stored in the storing means, wherein:

when voice is recognized by the recognizing means,  
25 the extracting means extracts a dictionary at a low-order

hierarchy of recognized voice as queuing words and the  
storing means stores it; and

a queuing word related to the recognized voice out  
of the queuing words stored in the storing means when  
5 the voice is recognized is stored as an object of  
comparison in succession.

[Claim 9] A voice recognition method for  
recognizing input voice by extracting a desired  
dictionary out of plural speech recognition dictionaries  
10 mutually hierarchically related as a list of queuing  
words, storing the list of queuing words in the extracted  
dictionary and comparing input voice and the list of  
the stored queuing words, wherein:

when voice is recognized, a dictionary at a low-order  
15 hierarchy of recognized voice is extracted and stored  
as queuing words; and

a queuing word related to the recognized voice out  
of the queuing words stored when the voice is recognized  
is stored as an object of comparison in succession.

20 [Detailed Description of invention]

[0001]

[Field of the Invention]

The present invention relates to a voice recognition  
unit the operability and the responsibility of which  
25 are enhanced and a method thereof.

[0002]

[Related Art]

Heretofore, in case the name of an institution is retrieved using a voice recognition unit, finally the name is vocalized after queuing words are narrowed down based upon a category and a place name as in a procedure for narrowing down shown in Fig. 13 because of securing the ratio of recognition and constraint such as usable memory size. Speech recognition in this case means speech recognition for operation by voice that for example, a car navigation system recognizes user's voice input via a microphone and executes processing for operation using the recognized voice and particularly means speech recognition in which operation for selecting a desired institution out of enormous institution candidates is made by voice. In an initial step, a control command dictionary for operating car navigation is set in the system and a user notifies the system of his/her intention to set a path to a destination by vocalizing a command, "setting a destination".

[0003]

The system is required to retrieve a concrete place to be a destination, however, as the number of institutions is enormous, the concrete place cannot be specified in one speech recognition. Then, to reduce

the number of institutions which are the objects of retrieval, narrowing down based upon a category name is performed. First, for narrowing down based upon a category name, after a category name dictionary is  
5 selected as a recognition dictionary, a user is prompted to vocalize a category name as 1) "Please vocalize a category name". In the meantime, when the user vocalizes 2) "Educational institution", a voice recognition unit recognizes the vocalization. The system prompts the  
10 user to specify a further detailed subcategory of the category of the educational institution and after a subcategory name dictionary is selected as the recognition dictionary, the user is prompted to vocalize a subcategory name as 3) "Next category name, please".  
15 In the meantime, when the user vocalizes 4) "High school", the voice recognition unit recognizes the vocalization.  
[0004]

When the subcategory is determined, the system vocalizes 5) "Prefectural name, please" after a  
20 prefectural name dictionary is selected as the recognition dictionary to narrow down based upon an area next and prompts the user to narrow down an area in units of a prefectural name. In the meantime, when the user vocalizes 6) Tokyo, the voice recognition unit  
25 recognizes the vocalization as Tokyo. In case the

subcategory is a high school and the prefectural name is Tokyo, it is determined in the system beforehand to prompt a user to specify a municipality name and after a municipality name dictionary is selected as  
5 the recognition dictionary, the system prompts the user to vocalize a municipality name as 7) "Municipality name, please". In the meantime, when the user vocalizes  
8) Shibuya Ward, the voice recognition unit recognizes the vocalization. As the number of institutions is  
10 narrowed down enough when specification is made so far, the retrieval of the institutional name is started.  
[0005]

After the system selects a dictionary of high schools in Shibuya Ward of Tokyo as the recognition dictionary,  
15 it prompts the user to vocalize an institutional name as 9) "The name, please". When the user vocalizes "School So-and-So", the voice recognition unit recognizes the vocalization and sets School So-and-So as a destination.  
[0006]

20 [problem to be solved by the invention]

As described above, a troublesome procedure that the hierarchical structure of speech recognition dictionaries is sequentially followed and all conditions for narrowing down are determined is required to be  
25 executed. A method of preparing all institutional names



to be finally retrieved at the upmost hierarchy to avoid the execution of the above-mentioned troublesome procedure exists.

[0007]

5        However, in this case, a memory having enormous capacity is required and there is also a problem that the ratio of recognition is deteriorated and the performance of a response is not satisfactory. For example, as a certain user does not play golf, he/she  
10 does not retrieve golf links, however, in case all institutional names including the category in which the user is not interested (in this case, golf links) are prepared, a certain institutional name may be recognized as the name of golf links by mistake. This  
15 imposes stress on a user.

#### SUMMARY OF THE INVENTION

[0008]

The invention is made in view of the above-mentioned situation and has an object to provide a voice recognition  
20 unit and a method thereof the operability of which is improved and the response of which is enhanced respectively by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand in  
25 addition to a dictionary for narrowing down at the upmost

hierarchy as objects of recognition.

[0009]

The invention also has an object to provide a voice recognition unit and a method thereof wherein an  
5 institutional name matched with the following  
narrowing-down condition can be retrieved by one  
vocalization by setting a narrowing-down condition such  
as a category and an area name frequently used by a  
user beforehand without troublesome processing that  
10 hierarchical structure is sequentially followed and  
a narrowing-down condition is determined and further,  
as a narrowing-down condition dictionary is also  
simultaneously an object of recognition, retrieval is  
enabled according to a conventional type procedure that  
15 hierarchical structure is sequentially followed and  
a narrowing-down condition is determined even if an  
institutional name unmatched with a narrowing-down  
condition set beforehand is required to be retrieved.

[0010]

20 [means for solving the problem]

To achieve the objects, the invention according  
to a first aspect is provided with plural speech  
recognition dictionaries mutually hierarchically  
related, extracting means that extracts a desired  
25 dictionary out of the speech recognition dictionaries

as a list of queuing words, selecting means that selects  
a desired dictionary out of the speech recognition  
dictionaries, storing means that stores the dictionary  
selected by the selecting means as a list of queuing  
5 words at a higher-order hierarchy than a preset hierarchy  
together with the normal dictionary extracted by the  
extracting means and recognizing means that recognizes  
input voice by comparing the input voice and the list  
of queuing words stored in the storing means.

10 [0011]

The invention according to a second aspect is based  
upon the voice recognition unit according to the first  
aspect and is characterized in that for a speech  
recognition dictionary, a classification dictionary  
15 storing the types of institutions and an institution  
dictionary storing the names of institutions every type  
are provided. Further, the invention according to a  
third aspect is based upon the voice recognition unit  
according to the first or second aspect and is  
20 characterized in that for a speech recognition dictionary,  
an area dictionary storing area names and an institution  
dictionary storing the names of institutions existing  
in any area every area are provided.

[0012]

25 The invention according to a fourth aspect is based

upon the voice recognition unit according to the second or third aspect and is characterized in that selecting means selects the institution dictionary as a desired dictionary. Further, the invention according to a fifth  
5 aspect is based upon the voice recognition unit according to the fourth aspect and is characterized in that extracting means extracts a dictionary at a low-order hierarchy of recognized voice as queuing words and extracts a dictionary which belongs to a dictionary  
10 selected by selecting means and which is located at a low-order hierarchy of recognized voice as queuing words.

[0013]

Owing to the above-mentioned configuration, when  
15 a speech recognition dictionary having hierarchical structure is retrieved, a recognition process is executed also using a dictionary classified according to at least one narrowing-down condition set by a user beforehand as an object of recognition together with a  
20 narrowing-down condition dictionary at the upmost hierarchy. That is, a voice recognition unit wherein the name of a target institution matched with the following narrowing-down condition can be retrieved by one vocalization without troublesome processing that  
25 hierarchical structure is sequentially followed and

a narrowing-down condition is determined in case a narrowing-down condition frequently used by a user such as a category and an area name is set beforehand can be provided. A voice recognition unit wherein the name  
5 of an institution unmatched with a preset narrowing-down condition can be retrieved according to a conventional type procedure that hierarchical structure is sequentially followed and a narrowing-down condition is determined in case the name of the institution  
10 unmatched with the preset narrowing-down condition is required to be retrieved because a narrowing-down condition dictionary is also simultaneously an object of recognition can be also provided.

[0014]

15 A voice recognition method according to a sixth aspect is used for a voice recognition unit having plural speech recognition dictionaries mutually hierarchically related and thereby, processing for recognizing input voice is executed using a dictionary  
20 classified according to at least one narrowing-down condition set by a user beforehand together with a narrowing-down condition dictionary at the upmost hierarchy as objects of recognition. The invention according to a seventh aspect is based upon the voice  
25 recognition method according to the sixth aspect and

is characterized in that a dictionary classified according to at least one narrowing-down condition set by a user beforehand is a dictionary the frequency of use of which is high.

5 [0015]

Hereby, the operability is improved by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand together with a narrowing-down  
10 condition dictionary at the upmost hierarchy as objects of recognition, the name of a target institution matched with the following narrowing-down condition can be retrieved by one vocalization by setting a narrowing-down condition frequently used by a user such as a category  
15 and an area name beforehand without troublesome processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined, and the operability and the responsibility are enhanced.  
[0016]

20 The invention according to an eighth aspect is provided with plural speech recognition dictionaries mutually hierarchically related, extracting means that extracts a desired dictionary out of the speech recognition dictionaries as a list of queuing words,  
25 storing means that stores the list of queuing words

in the dictionary extracted by the extracting means  
and recognizing means that recognizes input voice by  
comparing the input voice and the list of queuing words  
stored in the storing means and is characterized in  
5 that when voice is recognized by the recognizing means,  
the extracting means extracts a dictionary at a low-order  
hierarchy of recognized voice as queuing words, the  
storing means stores it and a queuing word related to  
the recognized voice out of the queuing words stored  
10 in the storing means when the voice is recognized is  
stored as an object of comparison in succession.  
[0017]

The invention according to a ninth aspect is based  
upon a voice recognition method for recognizing input  
15 voice by extracting a desired dictionary out of plural  
speech recognition dictionaries mutually  
hierarchically related as a list of queuing words,  
storing the list of queuing words in the extracted  
dictionary and comparing input voice and the stored  
20 list of queuing words and is characterized in that when  
voice is recognized, a dictionary at a low-order  
hierarchy of recognized voice is extracted and stored  
as queuing words and a queuing word related to the  
recognized voice out of the queuing words stored when  
25 the voice is recognized is stored as an object of

comparison in succession.

[0018]

[Detailed description of the embodiments of the invention]

5        Fig. 1 is a block diagram showing an embodiment of a voice recognition unit according to the invention.

As shown in Fig. 1, a microphone 100 collects the vocalization of a user, converts it to an electric signal and supplies it to a characteristic value calculating  
10    section 101. The characteristic value calculating section 101 converts pulse code modulation (PCM) data to a characteristic value suitable for speech recognition and supplies it to a recognizing section 102. The recognizing section 102 calculates similarity between  
15    input voice converted to a characteristic value and each queuing word in a recognition dictionary loaded into RAM 103 and outputs n pieces of queuing words higher in similarity and respective similarity (scores) to a control section 107 as a result.

20    [0019]

A recognition dictionary storing section 105 stores plural dictionaries for speech recognition. For the types of dictionaries, there are a narrowing-down condition dictionary and provided every narrowing-down  
25    condition and an institutional name dictionary storing



final place names classified by the combination of  
narrowing-down conditions, for example concrete  
institutional names. Further, for the dictionary  
according to a narrowing-down condition, there are a  
5 large area dictionary storing area names showing a large  
area such as a prefectural name for retrieving a place,  
a small area dictionary provided every prefecture and  
storing area names showing a small area such as a  
municipality name which belongs to each prefecture,  
10 a category dictionary storing great classification  
category names of retrieval places such as the type  
of an institution and a subcategory dictionary provided  
every great classification category and storing  
subcategory names which belong to each great  
15 classification category.

[0020]

A recognition dictionary selecting section 104  
selects a desired dictionary out of dictionaries stored  
in the recognition dictionary storing section 105  
20 according to an instruction from the control section  
107 and loads it into RAM 103 as queuing words. An  
initial setting section 108 is composed of a remote  
control key or voice operation means for a user to select  
so as to set a desired dictionary out of institutional  
25 name dictionaries according to the combination of

narrowing-down conditions as a dictionary at the upmost hierarchy. An institutional name dictionary set in the initial setting section 108 is an initial setting dictionary by a user. A method of setting will be described later. An initial setting storing section 106 stores a narrowing-down condition set by a user as initial setting via the initial setting section 108 or which institutional name dictionary a user sets as an initial setting dictionary.

10 [0021]

A voice synthesizing section 109 generates synthetic voice for a guidance message and an echo and outputs it to a speaker 112. A retrieving section 111 is provided with databases of map data not shown and others and retrieves the location map, the address, the telephone number and the service contents of an institution finally retrieved by speech recognition from a detailed information database. A result display section 110 is a display for displaying detailed information retrieved by the retrieving section 111 together with the result of recognition in voice operation, queuing words, a guidance message and an echo.

[0022]

25 The control section 107 controls each component

according to the result of output outputted from the  
above-mentioned each component. That is, the control  
section 107 controls so that the recognition dictionary  
selecting section 104 first extracts a category  
5 dictionary from the recognition dictionary storing  
section 105 when the retrieval of an institution by  
speech recognition is made and sets the extracted  
category dictionary in RAM 103 as queuing words. At  
this time, the control section controls so that a  
10 narrowing-down condition or an institutional name  
dictionary set by a user beforehand is recognized by  
referring to the initial setting storing section 106,  
the recognition dictionary selecting section 104  
similarly extracts the corresponding narrowing-down  
15 condition or the corresponding institutional name  
dictionary from the recognition dictionary storing  
setting 105 and sets it in RAM 103 as queuing words.  
[0023]

The voice synthesizing section 109 is instructed  
20 to generate a guidance message, "Please vocalize a  
category name" for example and to output it from the  
speaker 112.

[0024]

When a queuing word in a category dictionary stored  
25 in RAM 103 as queuing words is input in voice, a dictionary

of a subcategory which belongs to a category shown by  
input voice is read from the recognition dictionary  
storing section 105 and is loaded into RAM 103 to be  
the next queuing word. When a queuing word in the  
5 subcategory dictionary stored in RAM 103 as queuing  
words is input in voice, the subcategory shown by input  
voice is stored, a large area dictionary related to  
the subcategory is read from the recognition dictionary  
storing section 105 and is loaded into RAM 103 to be  
10 the next queuing word.

[0025]

When a queuing word in the large area dictionary  
stored in RAM 103 as queuing words is input in voice,  
a dictionary of a small area which belongs to the input  
15 large area is read from the recognition dictionary  
storing section 105 and is loaded into RAM 103 to be  
the next queuing word. When a queuing word in the small  
area dictionary stored in RAM 103 as queuing words is  
input in voice, the small area shown by input voice  
20 is stored, a dictionary showing a concrete one place  
related to the small area is read from the recognition  
dictionary storing section 105 and is loaded into RAM  
103 to be the next queuing word. As described above,  
a dictionary composed of queuing words is hierarchically  
25 stored in the recognition dictionary storing section

105 so that it is sequentially changed and is  
hierarchically used. That is, as shown as a hierarchical  
dictionary tree in Figs. 2 to 5 described later, a  
subcategory dictionary is located under a category  
5 dictionary, a small area dictionary is located under  
a large area dictionary and plural dictionaries showing  
a concrete one place exist at the bottom hierarchy.  
[0026]

Figs. 2 to 12 are explanatory drawings for explaining  
10 the operation of this embodiment of the invention shown  
in Fig. 1, Figs. 2 to 5 show a hierarchical dictionary  
tree of speech recognition dictionaries having  
hierarchical structure, Figs. 6 to 8 are flowcharts  
showing the operation and Figs. 9 to 12 show the  
15 configuration of a screen for the initial setting of  
a narrowing-down condition.  
[0027]

The invention is characterized in that in retrieving  
a speech recognition dictionary having hierarchical  
20 structure, a recognition process is also applied to  
one or plural institutional name dictionaries set by  
a user beforehand (dictionaries classified according  
to a narrowing-down condition and equivalent to a  
dictionary of hospitals and a dictionary of  
25 accommodations in the hierarchical dictionary tree shown

in Fig. 3) together with a first narrowing-down condition dictionary (a category name dictionary in the hierarchical dictionary tree shown in Fig. 3) at a first hierarchy as an object of recognition.

5 [0028]

That is, if a user sets a narrowing-down condition such as a category and an area name respectively frequently used by a user beforehand, an institutional name to be a target which is matched with the  
10 narrowing-down condition can be retrieved by one vocalization without troublesome processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined. As a narrowing-down condition dictionary is also  
15 simultaneously an object of recognition, even an institutional name which is not matched with the narrowing-down condition set beforehand can be retrieved according to a conventional type procedure that hierarchical structure is sequentially followed and  
20 a narrowing-down condition is determined.

[0029]

It is desirable that the number or the size of institutional name dictionaries (dictionaries classified according to a narrowing-down condition)  
25 which can be set beforehand is set by a system designer

beforehand from the viewpoint of the ratio of recognition  
and because of the limit of usable memory capacity.

[0030]

In a recognition process at a first hierarchy, even  
5 if a word in a category name dictionary is recognized,  
a dictionary (a dictionary of accommodations in the  
hierarchical dictionary tree shown in Fig. 5) matched  
with a narrowing-down condition and including a queuing  
word related to recognized voice out of queuing words  
10 stored as the queuing words in a dictionary being an  
object of recognition in recognition such as an  
institutional name dictionary (a dictionary classified  
according to the narrowing-down condition and equivalent  
to a dictionary of hospitals and a dictionary of  
15 accommodations in the hierarchical dictionary tree shown  
in Fig. 5) set by a user beforehand and shown in the  
hierarchical dictionary tree in Fig. 5 may be also an  
object of recognition together with the subcategory  
name dictionary. A recognition process at a third or  
20 the succeeding hierarchy is also similar.

[0031]

Referring to the drawings, the recognition process  
will be described in detail below. First, according  
to the hierarchical dictionary tree shown in Fig. 2,  
25 communication between a system and a user is as follows.

- (1) The system: "Please vocalize a command"
- (2) The user : "Hospital"
- (3) The system: "Next category, please"
- (4) The user : "Clinic"
- 5 (5) The system: "Prefectural name, please"
- (6) The user : "Saitama Prefecture"
- (7) The system: "Municipality name, please"
- (8) The user : "Kawagoe City"
- (9) The system: "The name, please"
- 10 (10) The user : "Dr. Kurita's office"

That is, in this case, speech recognition is made with a dictionary of hospitals (clinics) in Kawagoe City of Saitama Prefecture 204 as an object of recognition for input voice, "Dr. Kurita's office".

15 [0032]

In the meantime, communication between the system and a user in case the user sets a hospital 302 and accommodations 303 beforehand, which is the characteristic of the invention as shown in the

20 hierarchical dictionary tree in Fig. 3 and in case the name of an institution matched with the set narrowing-down conditions is retrieved is as follows.

- (1) The system: "Please vocalize a category name or an institutional name"
- 25 (2) The user : "Dr. Saito's office"



[0033]

In this case, speech recognition is made with a category name dictionary 301, a dictionary of hospitals 302 and a dictionary of accommodations 303 as an object  
5 of recognition for input voice, "Dr. Saito's office".

As the object (Dr. Saito's office) is included in the dictionary of hospitals 302 in this case, retrieval processing is finished by one vocalization. The dictionary of hospitals 302 is a set of dictionaries  
10 (307, 308, ---, 313) of names which belong to all subcategories of hospitals in all municipalities of all prefectures and the dictionary of accommodations 303 is also similar.

[0034]

15 In the meantime, communication between the system and a user in case the name of an institution not matched with a set narrowing-down condition is retrieved as shown in the hierarchical dictionary tree in Fig. 4 and in case only a narrowing-down condition dictionary  
20 is an object of recognition at a second or the succeeding hierarchy is as follows.

(1) The system: "Please vocalize a category name or an institutional name"

(2) The user : "Station name"

25 (3) The system: "Subcategory name, please"

- (4) The user : "Private railroad"  
(5) The system: "Prefectural name, please"  
(6) The user : "Saitama Prefecture"  
(7) The system: "Municipality name, please"  
5 (8) The user : "Kumagaya City"  
(9) The system: "Station name, please"  
(10) The user : "Ishiwara Station"

[0035]

In this case, speech recognition is made with a  
10 dictionary of station names (of private railroads) in  
Kumagaya City of Saitama Prefecture 408 as an object  
of recognition for input voice, "Ishiwara Station".  
As the object (Ishiwara Station) is not included in  
first hierarchy queuing dictionaries 400, the user  
15 vocalizes a category name included in a category name  
dictionary 401 at a first hierarchy and afterward,  
retrieval processing is executed according to a  
conventional type method.

[0036]

20 Next, a case that the name of an institution matched  
with a set narrowing-down condition is retrieved and  
institutional name dictionaries matched with a  
narrowing-down condition set beforehand together with  
the set narrowing-down condition and a narrowing-down  
25 condition determined in a process of retrieval is an

object of recognition at a second or the succeeding hierarchy will be described referring to Fig. 5. In this case, communication between the system and a user is as follows.

5       (1) The system: "Please vocalize a category name or an institutional name"

          (2) The user : "Accommodations"

          (3) The system: "Subcategory name or institutional name, please"

10       (4) The user : "Kobayashi Hotel"

[0037]

In this case, speech recognition is made with a subcategory name dictionary of accommodations 505 and a dictionary of accommodations 503 as objects of  
15 recognition for input voice, "Kobayashi Hotel". As the object (Kobayashi Hotel) is included in the dictionary of accommodations 503, retrieval processing is finished at this time.

[0038]

20       Institutional name dictionaries matched with the narrowing-down condition set beforehand together with the narrowing-down condition dictionary and the narrowing-down condition determined in the process of retrieval are objects of recognition at the second or  
25 the succeeding hierarchy. For example,

(1) The system: "Please vocalize a category name  
or an institutional name"

(2) The user : "Accommodations"

(3) The system: "Subcategory name or institutional  
5 name, please"

(4) The user : "Japanese-style hotel"

(5) The system: "Prefectural name or institutional  
name, please"

(6) The user : "Kobayashi Hotel"

10 [0039]

Communication between the system and a user in case  
the name of an institution not matched with a preset  
narrowing-down condition is retrieved is as follows.

(1) The system: "Please vocalize a category name  
15 or an institutional name"

(2) The user : "Station name"

(3) The system: "Subcategory name, please" (\*)

(4) The user : "JR"

(5) The system: "Prefectural name, please" (\*)

20 (6) The user : "Saitama Prefecture"

(7) The system: "Municipality name, please" (\*)

(8) The user : "Kumagaya City"

(9) The system: "Station name, please"

(10) The user : "Kumagaya Station"

25 [0040]

In this case, speech recognition is made with a dictionary of station names (of JR) in Kumagaya City of Saitama Prefecture as an object of recognition for input voice, "Kumagaya Station". As no institution  
5 matched with the preset narrowing-down condition and all narrowing-down conditions determined in a process of retrieval exists, an institutional name is not included in the guidance of the system in items to which the mark \* is added in the above-mentioned communication  
10 between the system and the user.

[0041]

Fig. 6 is a flowchart showing a procedure for development in hierarchies in the hierarchical dictionary tree shown in Fig. 3. Referring to the  
15 hierarchical dictionary tree shown in Fig. 3 and the flowchart shown in Fig. 6, the operation of the embodiment of the invention shown in Fig. 1 will be described below.

[0042]

First, a user sets a narrowing-down condition by  
20 the initial setting section 108 in a step S600. As its initial set value is stored in the initial setting storing section 106, this processing has only to be executed once at initial time and is not required to be executed every retrieval. In a step S601, it is  
25 judged whether the initiation of retrieval is triggered

by a vocalization button and others or not and in case it is not triggered, control is returned to the step S601.

[0043]

5       In the meantime, in case the initiation of retrieval is triggered, control proceeds to processing in a step S602, and the category name dictionary 301 and one or plural institutional name dictionaries stored in the initial setting storing section 106 and matched with  
10 the condition set by the user beforehand are loaded into RAM 103. In a step S603, a recognition process is executed using the dictionaries loaded into RAM 103 as objects of recognition. At this time, the user vocalizes a category name or an institutional name  
15 matched with the condition set beforehand.

[0044]

      In a step S604, in case the result of recognition in the step S603 is the institutional name, control is transferred to processing in a step S613, the result  
20 is displayed by the result display section 110, text-to-speech (TTS) output is made and retrieval processing is executed by the retrieving section 111.

      In case the result of recognition is not an institutional name in the step S604, control is transferred to  
25 processing in a step S605 and a subcategory name

dictionary in the category of the result of recognition is loaded into RAM 103. In a step S606, a recognition process is executed using the dictionary corresponding to a subcategory name vocalized by the user and loaded  
5 into RAM 103 as an object of recognition.

[0045]

In a step S607, a prefectural name dictionary is loaded into RAM 103 and in a step S608, a recognition process is executed using the dictionary corresponding  
10 to a prefectural name vocalized by the user and loaded into RAM 103 as an object of recognition. In a step S609, a municipality name dictionary of a prefecture as the result of recognition in the step S608 is loaded into RAM 103 and a recognition process is executed using  
15 the dictionary corresponding to a municipality name vocalized by the user in a step S610 and loaded into RAM 103 as an object of recognition.

[0046]

In a step S611, institutional name dictionaries  
20 matched with conditions acquired as the result of recognition in the steps S603, S606, S608 and S610 are loaded into RAM 103 and a recognition process is executed using the dictionary corresponding to an institutional name vocalized by the user in a step S612 and loaded  
25 into RAM 103 as an object of recognition. Finally,

in a step S613, the result is displayed by the result display section 110, TTS output is made and retrieval processing is executed by the retrieving section 111.  
[0047]

5        Fig. 7 is a flowchart showing a procedure for development in hierarchies in the hierarchical dictionary tree shown in Fig. 5. Referring to the hierarchical dictionary tree shown in Fig. 5 and the flowchart shown in Fig. 7, the operation of the embodiment  
10 of the invention shown in Fig. 1 will be described below.  
[0048]

First, a user sets a narrowing-down condition via the initial setting section 108 in a step S700. As its initial set value is stored in the initial setting  
15 storing section 106, this processing has only to be executed once at initial setting time and is not required to be executed every retrieval. In a step S701, it is judged whether the initiation of retrieval is triggered by a vocalization button and others or not  
20 and in case it is not triggered, control is returned to processing in the step S701. When the initiation of retrieval is triggered, control is transferred to processing in a step S702, and the category name dictionary and one or plural institutional name  
25 dictionaries stored in the initial setting storing



section 106 and matched with the condition set by the user beforehand are loaded into RAM 103. In a step S703, a recognition process is executed using the dictionary loaded into RAM 103 as an object of recognition.

5 At this time, the user vocalizes a category name or an institutional name matched with the condition set beforehand.

[0049]

In a step S704, in case the result of recognition  
10 in the step S703 is the institutional name, control is transferred to processing in a step S716. In case the result of recognition is not the institutional name, control is transferred to processing in a step S705, the subcategory name dictionary in the category of the  
15 result of recognition and an institutional name dictionary matched with both the condition set beforehand and a condition acquired as a result of recognition in the step S703 are loaded into RAM 103 and a recognition process is executed using the dictionary corresponding  
20 to the subcategory name or the institutional name vocalized by the user in the step S706 and loaded into RAM 103 as an object of recognition.

[0050]

In a step S707, in case the result of recognition  
25 in the step S706 is the institutional name, control

is transferred to the processing in the step S716.  
In case the result of recognition is not the institutional  
name, control is transferred to processing in a step  
S708, the prefectural name dictionary and an  
5 institutional name dictionary matched with the condition  
set beforehand and all conditions acquired as a result  
of recognition in the steps S703 and S706 are loaded  
into RAM 103 and a recognition process is executed using  
the dictionary corresponding to a prefectural name or  
10 an institutional name vocalized by the user in a step  
S709 and loaded into RAM 103 as an object of recognition.  
[0051]

In a step S710, in case the result of recognition  
in the step S709 is the institutional name, control  
15 is transferred to the processing in the step S716.  
In case the result of recognition is not the institutional  
name, control is transferred to processing in a step  
S711, a municipality name dictionary of a prefecture  
as a result of recognition in the step S709 and an  
20 institutional name dictionary matched with the condition  
set beforehand and all conditions acquired as a result  
of recognition in the steps S703, S706 and S709 are  
loaded into RAM 103 and a recognition process is executed  
using the dictionary corresponding to a municipality  
25 name or an institutional name vocalized by the user

in a step S712 and loaded into RAM 103 as an object of recognition.

[0052]

In a step S713, in case the result of recognition  
5 in the step S712 is the institutional name, control is transferred to the processing in the step S716. In case the result of recognition is not the institutional name, control is transferred to processing in a step S714. An institutional name dictionary matched with  
10 all conditions acquired as a result of recognition in the steps S703, S706, S709 and S712 is loaded into RAM 103 and a recognition process is executed using the dictionary corresponding to an institutional name vocalized by the user in a step S715 and loaded into  
15 RAM 103 as an object of recognition. Finally, in the step S716, the result is displayed, TTS output is made and retrieval processing is executed.

[0053]

Fig. 8 is a flowchart showing the detailed procedure  
20 of a recognition process shown in Figs. 6 and 7 (in the steps S603, S606, S608, S610, S612, S703, S706, S709, S712 and S715).

[0054]

Referring to the flowchart shown in Fig. 8, a  
25 recognition process executed in the above-mentioned

each step will be described below. First, in a step S800, it is detected whether input from the microphone 100 includes voice or not. For a method of detection, there is a method of regarding as voice in case power exceeds a certain threshold. The detection of voice is judged as the initiation of voice, in a step S801 the characteristic value is calculated by the characteristic value calculating section 101 and in a step S802, similarity between each word included in a recognition dictionary loaded into RAM 103 and a characteristic value calculated based upon input voice is calculated. In a step S803, in case the voice is not finished, control is returned to the processing in the step S801. In case the voice is finished, a word the similarity of which is the highest is output as a result of recognition in a step S804.

[0055]

Finally, for a method of the initial setting of a narrowing-down condition, two cases of a case using a remote control and a case by speech recognition will be described.

[0056]

In case a remote control is used, an item of narrowing-down condition setting change is first selected on a menu screen displayed by pressing a menu

button of the remote control. Hereby, a narrowing-down condition setting change screen shown in Fig. 9 is displayed. On the narrowing-down condition setting change screen, a group of institutional name dictionaries  
5 classified according to a narrowing-down condition (a prefectural name and a category name) is allocated and arranged in a matrix. In this case, a cursor is moved to a condition name for the setting to be changed by a joy stick of the remote control.

10 [0057]

For example, a desired prefecture in a list of prefectures is selected by moving the joy stick in a transverse direction as shown in Fig. 10. In case a determination button of the remote control is pressed  
15 when Saitama Prefecture is selected for example, a condition in the position of the cursor (institutional name dictionaries in all categories existing in Saitama Prefecture) becomes a narrowing-down condition.

[0058]

20 Also, a desired category in a list of category names is selected by moving the joy stick in a longitudinal direction as shown in Fig. 11. In case the determination button is pressed when hospitals are selected for example,  
a condition in the position of the cursor (hospital  
25 name dictionaries all over the country) becomes a

narrowing-down condition. Further, when hospitals are selected as shown in Fig. 11 after Saitama Prefecture is selected on a display screen shown in Fig. 10, a hospital name dictionary of Saitama Prefecture is  
5 narrowed down as shown in Fig. 12.

[0059]

In this case, the name dictionary selected in case "Saitama Prefecture" and "hospital" are set for an initial set value is shown, however, it is not essential  
10 to set both a prefectural name and a hospital name and each may be also set independently. Also, in case it is set beforehand that a condition in a position where the determination button is pressed becomes a narrowing-down condition, the setting is to be released.  
15 That is, in case the above-mentioned condition becomes a narrowing-down condition, the setting is released and in case the above-mentioned condition does not become a narrowing-down condition, the setting is changed so that the condition becomes a narrowing-down condition.  
20 Further, the case that a narrowing-down condition is selected by the joy stick is described above, however, in place of the joy stick, a touch panel may be also used.

[0060]

25 A case that the initial setting of a narrowing-down

condition is made by speech recognition will be described below. A word meaning narrowing-down condition changing processing such as the change of setting is also added to a queuing dictionary at a first hierarchy  
5 of speech recognition and in case the word is recognized, narrowing-down condition setting changing processing is started. First, in setting changing processing, a speech recognition process is executed using a dictionary having narrowing-down condition names as  
10 queuing words, in case a recognized condition is turned on, it is turned off and in case it is turned off, the setting is changed so that the condition is turned on.  
[0061]

Next, in the setting changing processing, a speech  
15 recognition process is executed using a dictionary having a queuing word to which turning on or turning off is added after each narrowing-down condition name, in case a recognized word includes turning on a condition name, the condition is turned on and in case the recognized  
20 word includes turning off a condition name, the condition is turned off. In the above-mentioned setting changing processing, continuous recognition using syntax that (a condition name) + (a word specifying turning on or turning off) may be also made.  
25 [0062]

As described above, according to the invention, the operability is improved and the responsibility is also enhanced respectively by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand in addition to a narrowing-down condition dictionary at the upmost hierarchy as objects of recognition.

[0063]

10 [Effect of the invention ]

As described above, the voice recognition method according to the invention is used for the voice recognition unit having plural speech recognition dictionaries having hierarchical structure, the improvement of the operability and the enhancement of the responsibility are made by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand together with the narrowing-down condition dictionary at the upmost hierarchy as objects of recognition and the name of a target institution matched with the following narrowing-down condition can be retrieved by one vocalization by setting a narrowing-down condition frequently used by a user such as a category and an area name beforehand without troublesome



processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined.

[0064]

Also, according to the invention, in case an  
5 institutional name unmatched with a narrowing-down  
condition set beforehand is retrieved, the conventional  
type procedure that a narrowing-down condition is  
sequentially determined can be taken. Further, in case  
an institutional name matched with a narrowing-down  
10 condition set beforehand is retrieved, processing for  
recognizing the institutional name can be also executed  
using one dictionary set finally matched with the  
narrowing-down condition after a narrowing-down  
condition is sequentially determined according to the  
15 conventional type procedure.

[Brief description of the drawings]

[Fig. 1]

Fig. 1 is a block diagram showing an embodiment  
of a voice recognition unit according to the invention;

20 [Fig. 2]

Fig. 2 is an explanatory drawing for explaining  
a voice recognition method according to the invention  
and shows an example of a hierarchical dictionary tree;

[Fig. 3]

25 Fig. 3 is an explanatory drawing for explaining

the voice recognition method according to the invention  
and shows an example of a hierarchical dictionary tree;  
[Fig. 4]

Fig. 4 is an explanatory drawing for explaining  
5 the voice recognition method according to the invention  
and shows an example of a hierarchical dictionary tree;  
[Fig. 5]

Fig. 5 is an explanatory drawing for explaining  
the voice recognition method according to the invention  
10 and shows an example of a hierarchical dictionary tree;  
[Fig. 6]

Fig. 6 is a flowchart showing a procedure for  
following hierarchies in the hierarchical dictionary  
tree shown in Fig. 3;  
15 [Fig. 7]

Fig. 7 is a flowchart showing a procedure for  
following hierarchies in the hierarchical dictionary  
tree shown in Fig. 5;  
[Fig. 8]

20 Fig. 8 is a flowchart showing the details of the  
procedures for a recognition process shown in Figs.  
6 and 7;  
[Fig. 9]

Fig. 9 shows the initial setting method of a  
25 narrowing-down condition on a display screen;

[Fig. 10]

Fig. 10 shows the initial setting method of a narrowing-down condition on the display screen;

[Fig. 11]

5 Fig. 11 shows the initial setting method of a narrowing-down condition on the display screen;

[Fig. 12]

Fig. 12 shows the initial setting method of a narrowing-down condition on the display screen; and

10 [Fig. 13]

Fig. 13 is an explanatory drawing for explaining a conventional type procedure for narrowing down.

[Explanation of symbol]

100. MICROPHONE, 101. CHARACTERISTIC VALUE CALCULATING  
15 SECTION, 102. RECOGNIZING SECTION, 103. RAM, 104.  
RECOGNITION DICTIONARY SELECTING SECTION, 105.  
RECOGNITION DICTIONARY STORING SECTION, 106. INITIAL  
SETTING STORING SECTION, 107. CONTROL SECTION, 108.  
INITIAL SETTING SECTION, 109. VOICE SYNTHESIZING SECTION  
20 110. RESULT DISPLAY SECTION, 111. RETRIEVING SECTION,  
112. SPEAKER

[Document name] Abstract

[Summary]

[Problem]

The invention has an object to avoid the execution  
5 of a troublesome procedure that the hierarchical  
structure of speech recognition dictionaries having  
hierarchical structure is sequentially followed and  
all narrowing-down conditions are determined when an  
institutional name and others are retrieved and to  
10 enhance the operability and the responsibility.

[means to solve]

A voice recognition unit according to the invention  
is composed of plural speech recognition dictionaries  
(a recognition dictionary storing section) having  
15 hierarchical structure, extracting means (a control  
section) that extracts a desired dictionary out of the  
speech recognition dictionaries as a list of queuing  
words, selecting means (a recognition dictionary  
selecting section) that selects a desired dictionary,  
20 storing means (RAM) that stores the dictionary selected  
by the selecting means as a list of queuing words at  
the upmost hierarchy together with the normal dictionary  
extracted by the extracting means and recognizing means  
(a recognizing section) that recognizes input voice  
25 by comparing the input voice and the list of queuing

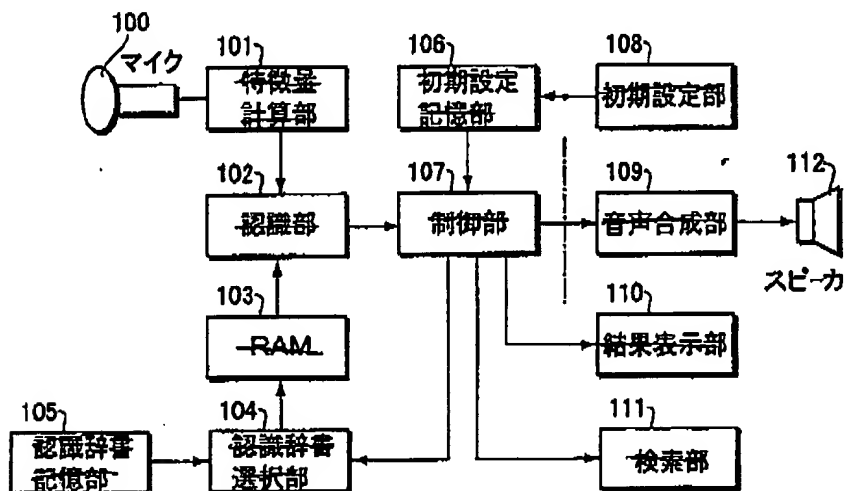
words stored in the storing means.

[selected drawing] FIG. 1

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特願2000-267954 頁: 1/ 13【書類名】 図面 Drawings  
Document Name  
(図1)

FIG. 1



## DRAWINGS

[FIG. 1]

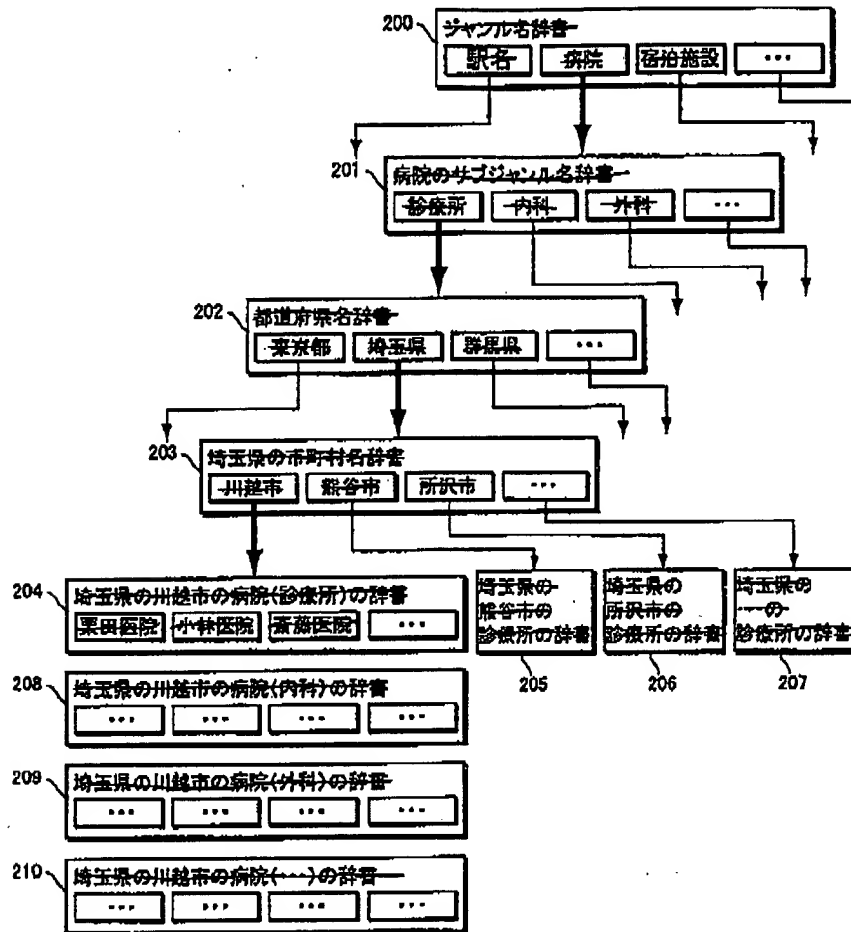
- 100. MICROPHONE
- 101. CHARACTERISTIC VALUE CALCULATING SECTION
- 5 102. RECOGNIZING SECTION
- 104. RECOGNITION DICTIONARY SELECTING SECTION
- 105. RECOGNITION DICTIONARY STORING SECTION
- 106. INITIAL SETTING STORING SECTION
- 107. CONTROL SECTION
- 10 108. INITIAL SETTING SECTION
- 109. VOICE SYNTHESIZING SECTION
- 110. RESULT DISPLAY SECTION
- 111. RETRIEVING SECTION
- 112. SPEAKER

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〔図2〕

FIG. 2





[FIG. 2]

200,

CATEGORY NAME DICTIONARY

STATION NAME, HOSPITAL, ACCOMMODATIONS

5 201,

HOSPITAL SUBCATEGORY NAME DICTIONARY

CLINIC, INTERNAL DEPARTMENT, SURGICAL DEPARTMENT

202

PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO, SAITAMA

10 , PREFECTURE, GUNMA PREFECTURE

203 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY

KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY

204 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (CLINIC)

DICTIONARY, DR. KURITA'S OFFICE, DR. KOBAYASHI'S OFFICE,

15 DR. SAITO'S OFFICE

205 SAITAMA PREFECTURE KUMAGAYA CITY CLINIC DICTIONARY

206 SAITAMA PREFECTURE TOKOROZAWA CITY CLINIC DICTIONARY

207 SAITAMA PREFECTURE SOMEWHERE CLINIC DICTIONARY

208 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (INTERNAL

20 DEPARTMENT) DICTIONARY

209 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SURGICAL

DEPARTMENT) DICTIONARY

210 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SO-AND-SO)

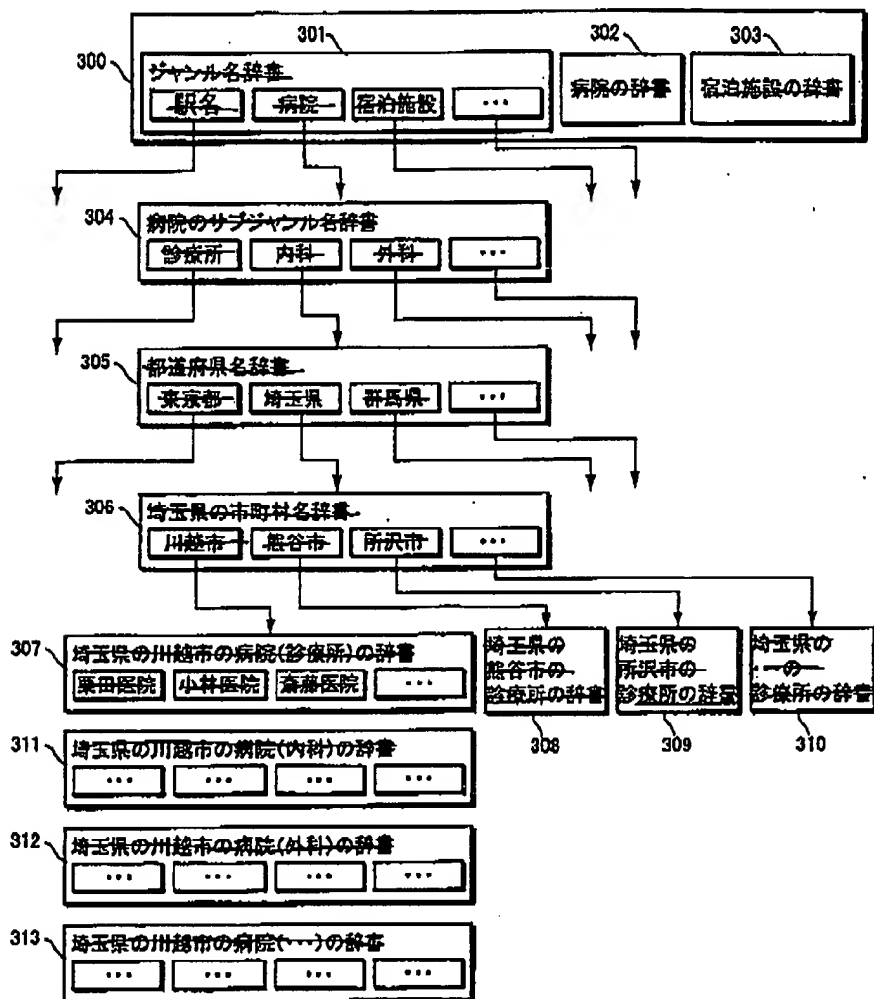
DICTIONARY

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{図3}

FIG. 3



[FIG. 3]

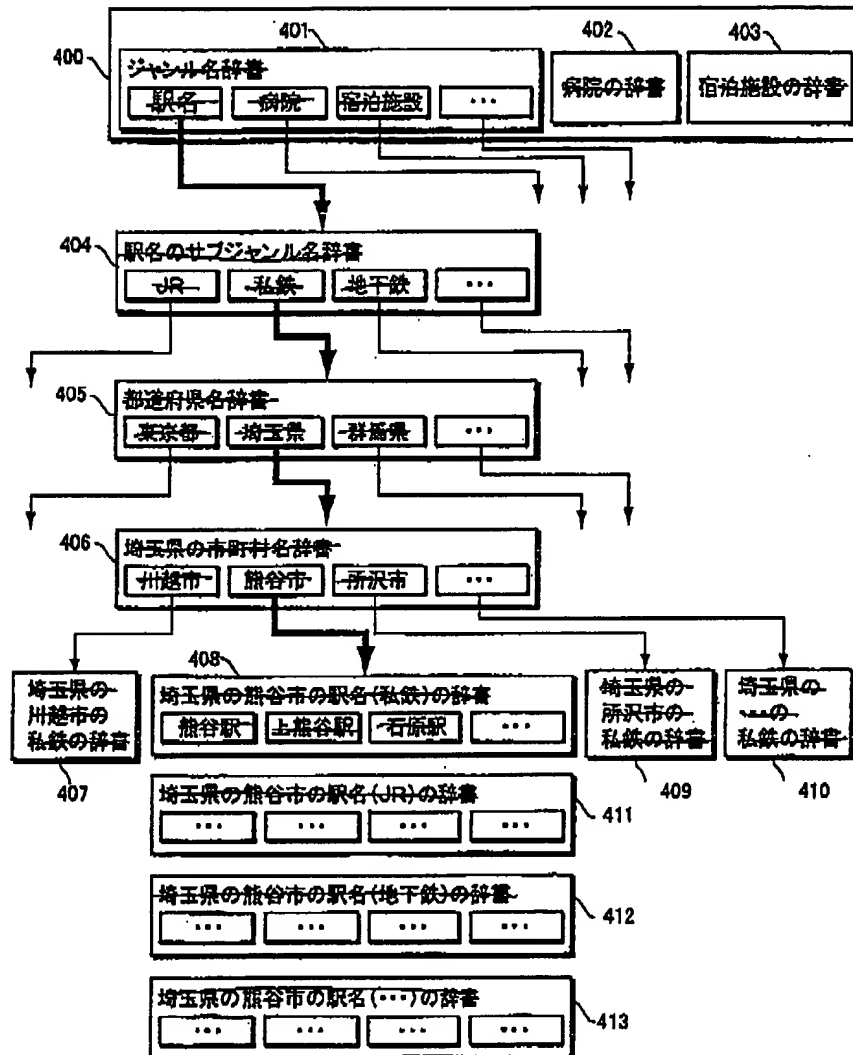
- 301 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL,  
ACCOMMODATIONS
- 302 HOSPITAL DICTIONARY
- 5 303 ACCOMMODATIONS DICTIONARY
- 304 HOSPITAL SUBCATEGORY NAME DICTIONARY  
CLINIC, INTERNAL DEPARTMENT, SURGICAL DEPARTMENT
- 305 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO,  
SAITAMA PREFECTURE, GUNMA PREFECTURE
- 10 306 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY  
KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY
- 307 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (CLINIC)  
DICTIONARY, DR. KURITA'S OFFICE, DR. KOBAYASHI'S OFFICE,  
DR. SAITO'S OFFICE
- 15 308 SAITAMA PREFECTURE KUMAGAYA CITY CLINIC DICTIONARY
- 309 SAITAMA PREFECTURE TOKOROZAWA CITY CLINIC DICTIONARY
- 310 SAITAMA PREFECTURE SOMEWHERE CLINIC DICTIONARY
- 311 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (INTERNAL  
DEPARTMENT) DICTIONARY
- 20 312 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SURGICAL  
DEPARTMENT) DICTIONARY
- 313 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SO-AND-SO)  
DICTIONARY

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【図4】

FIG. 4



[FIG. 4]

- 401 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL,  
ACCOMMODATIONS
- 402 HOSPITAL DICTIONARY
- 5 403 ACCOMMODATIONS DICTIONARY
404. STATION NAME SUBCATEGORY NAME DICTIONARY  
JR, PRIVATE RAILROAD, SUBWAY
- 405 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO,  
SAITAMA PREFECTURE, GUNMA PREFECTURE
- 10 406 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY  
KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY
407. SAITAMA PREFECTURE KAWAGOE CITY PRIVATE RAILROAD  
DICTIONARY
408. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME
- 15 (PRIVATE RAILROAD) DICTIONARY KUMAGAYA STATION,  
KAMIKUMAGAYA STATION, ISHIWARA STATION
409. SAITAMA PREFECTURE TOKOROZAWA CITY PRIVATE RAILROAD  
DICTIONARY
410. SAITAMA PREFECTURE SOMEWHERE PRIVATE RAILROAD
- 20 DICTIONARY
411. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME (JR)  
DICTIONARY
412. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME  
(SUBWAY) DICTIONARY
- 25 413. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME

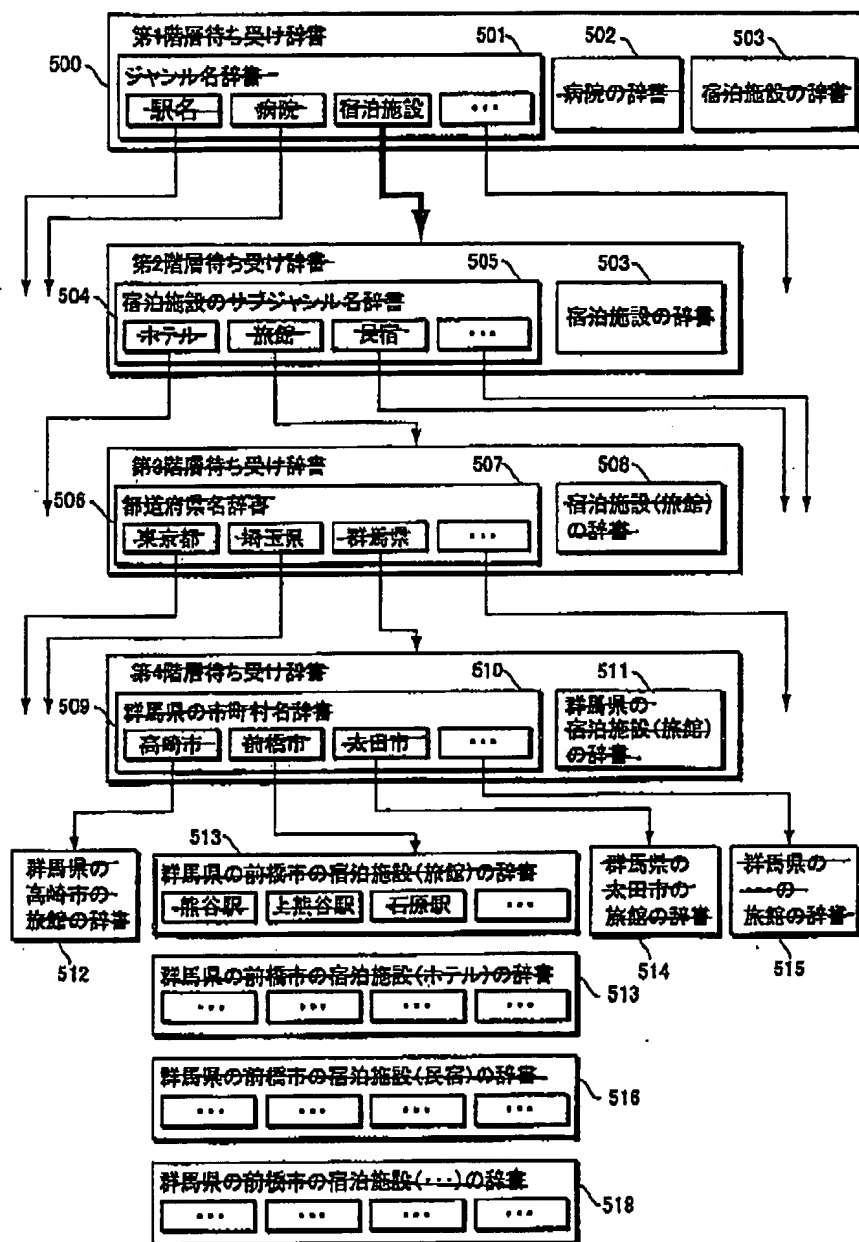
(SO-AND-SO) DICTIONARY

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{図5}

FIG. 5



[FIG. 5]

500. FIRST HIERARCHY QUEUING DICTIONARIES

501 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL,  
ACCOMMODATIONS

5 502 HOSPITAL DICTIONARY

503 ACCOMMODATIONS DICTIONARY

504. SECOND HIERARCHY QUEUING DICTIONARIES

505. ACCOMMODATIONS SUBCATEGORY NAME DICTIONARY

HOTEL, JAPANESE-STYLE HOTEL, PRIVATE HOUSE PROVIDING

10 BED AND MEALS

506. THIRD HIERARCHY QUEUING DICTIONARIES

508. ACCOMMODATIONS (JAPANESE-STYLE HOTEL) DICTIONARY

507 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO,  
SAITAMA PREFECTURE, GUNMA PREFECTURE

15 509. FOURTH HIERARCHY QUEUING DICTIONARIES

510. GUNMA PREFECTURE MUNICIPALITY NAME DICTIONARY

TAKASAKI CITY, MAEBASHI CITY, OTA CITY

511. GUNMA PREFECTURE ACCOMMODATIONS (JAPANESE-STYLE  
HOTEL) DICTIONARY

20 512. GUNMA PREFECTURE TAKASAKI CITY JAPANESE-STYLE HOTEL  
DICTIONARY

513. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS  
(JAPANESE-STYLE HOTEL) DICTIONARY

KUMAGAYA STATION, KAMIKUMAGAYA STATION, ISHIWARA

25 STATION



513. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS  
(HOTEL) DICTIONARY

514. GUNMA PREFECTURE OTA CITY JAPANESE-STYLE HOTEL  
DICTIONARY

5 515. GUNMA PREFECTURE SOMEWHERE JAPANESE-STYLE HOTEL  
DICTIONARY

516. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS  
(PRIVATE HOUSE PROVIDING BED AND MEALS) DICTIONARY

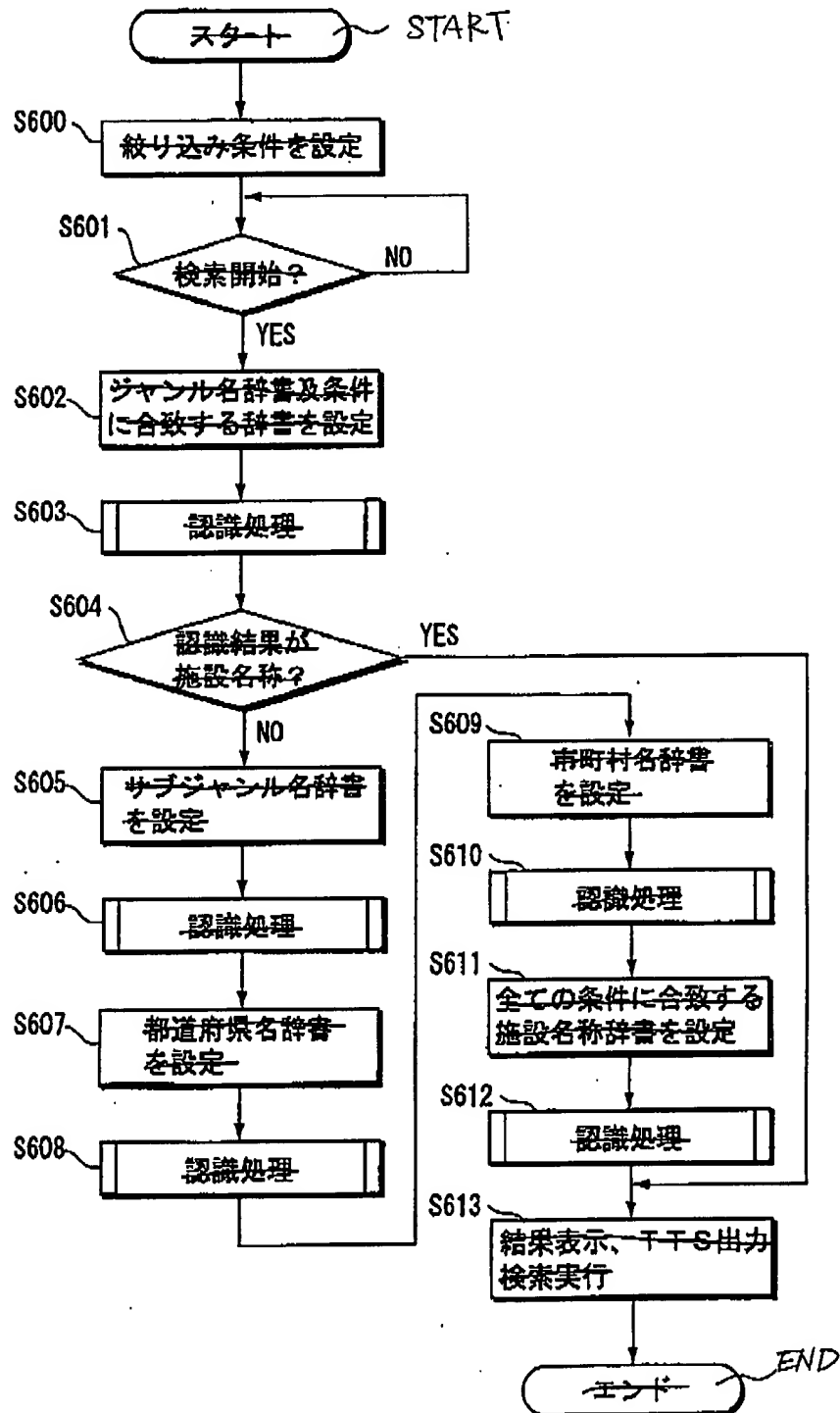
518. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS  
10 (SO-AND-SO) DICTIONARY

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【図6】

FIG. 6



[FIG. 6]

S600 SET NARROWING-DOWN CONDITION

S601 IS RETRIEVAL STARTED?

S602 SET DICTIONARY MATCHED WITH CATEGORY NAME DICTIONARY

5 AND CONDITION

S603 RECOGNITION PROCESS

S604 IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S605 SET SUBCATEGORY NAME DICTIONARY

S606 RECOGNITION PROCESS

10 S607 SET PREFECTURAL NAME DICTIONARY

S608 RECOGNITION PROCESS

S609 SET MUNICIPALITY NAME DICTIONARY

S610 RECOGNITION PROCESS

S611 SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

15 ALL CONDITIONS

S612 RECOGNITION PROCESS

S613 DISPLAY RESULT, OUTPUT TTS AND EXECUTE RETRIEVAL

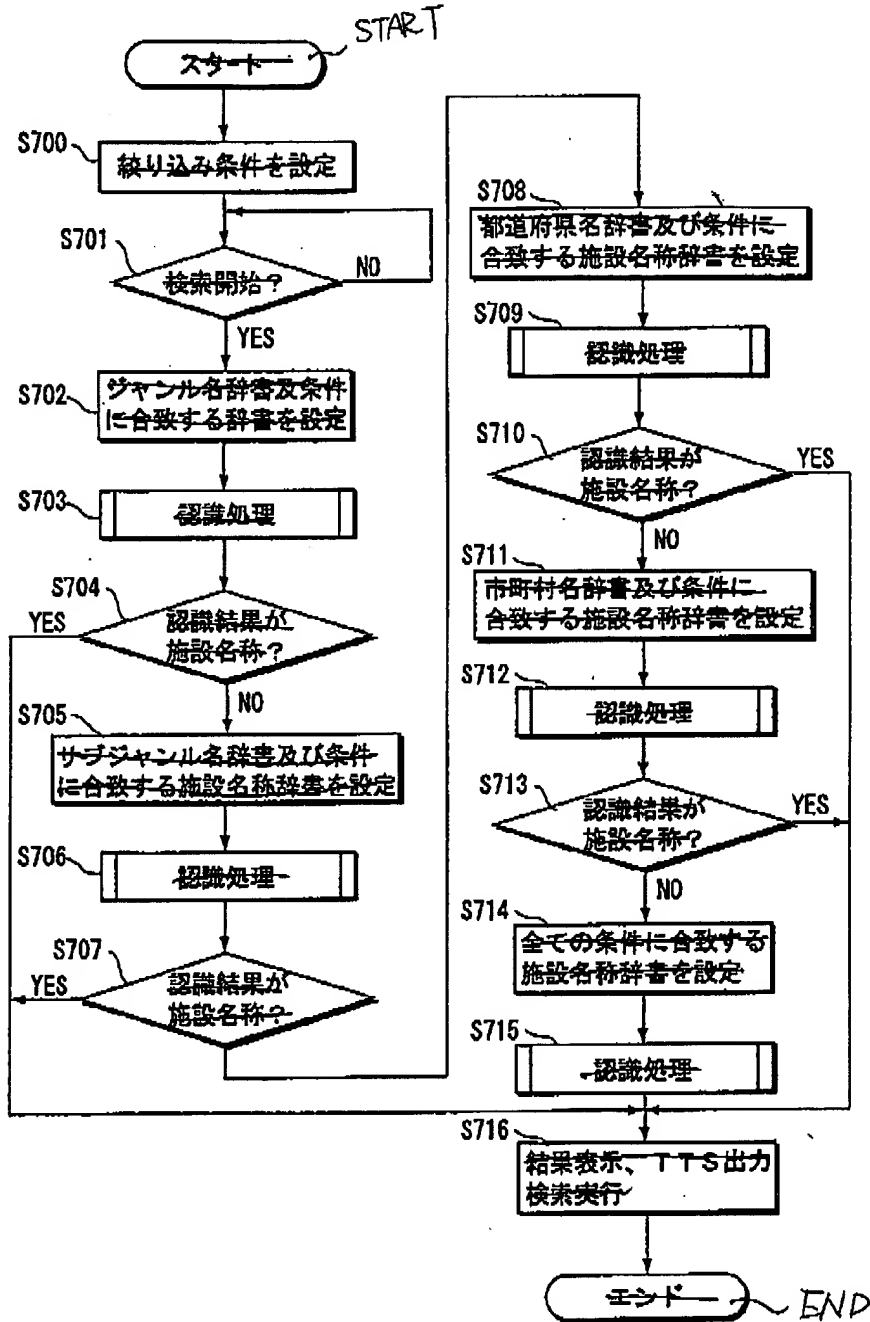
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【図7】

FIG. 7



[FIG. 7]

S700 SET NARROWING-DOWN CONDITION

S701 IS RETRIEVAL STARTED?

S702 SET DICTIONARY MATCHED WITH CATEGORY NAME DICTIONARY

5 AND CONDITION

S703. RECOGNITION PROCESS

S704 S710, S713. IS RESULT OF RECOGNITION INSTITUTIONAL  
NAME?

S705. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH  
10 SUBCATEGORY NAME DICTIONARY AND CONDITION

S706. RECOGNITION PROCESS

S707. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S708. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH  
PREFECTURAL NAME DICTIONARY AND CONDITION

15 S709. RECOGNITION PROCESS

S710. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S711. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH  
MUNICIPALITY NAME DICTIONARY AND CONDITION

S712 RECOGNITION PROCESS

20 S713. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S714. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH  
ALL CONDITIONS

S715. RECOGNITION PROCESS

S716. DISPLAY RESULT, OUTPUT TTS AND EXECUTE RETRIEVAL

25

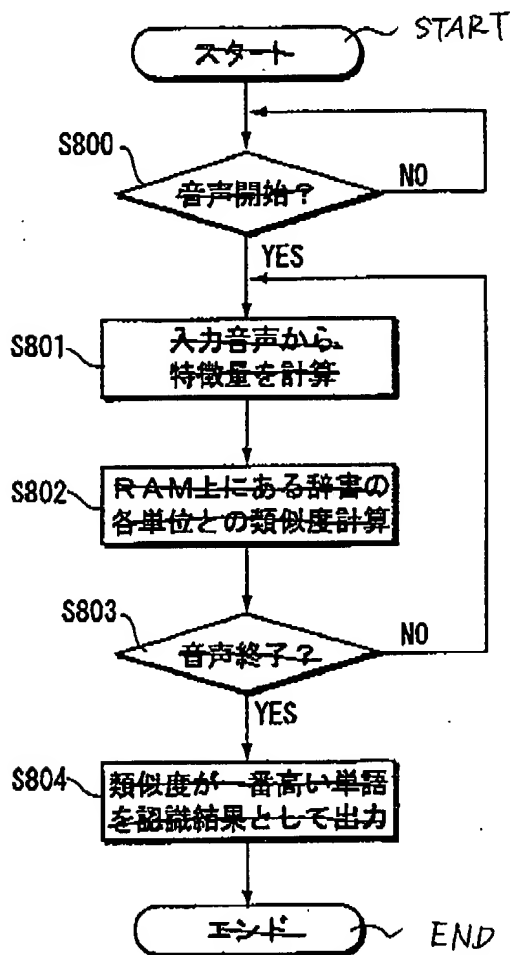
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{図8}

FIG. 8



[FIG. 8]

S800. IS VOICE STARTED?

S801. CALCULATE CHARACTERISTIC VALUE BASED UPON INPUT  
VOICE

5 S802. CALCULATE SIMILARITY BETWEEN EACH UNIT IN  
DICTIONARY LOADED INTO RAM

S803. IS VOICE FINISHED?

S804. OUTPUT WORD SIMILARITY OF WHICH IS HIGHEST AS  
RESULT OF RECOGNITION

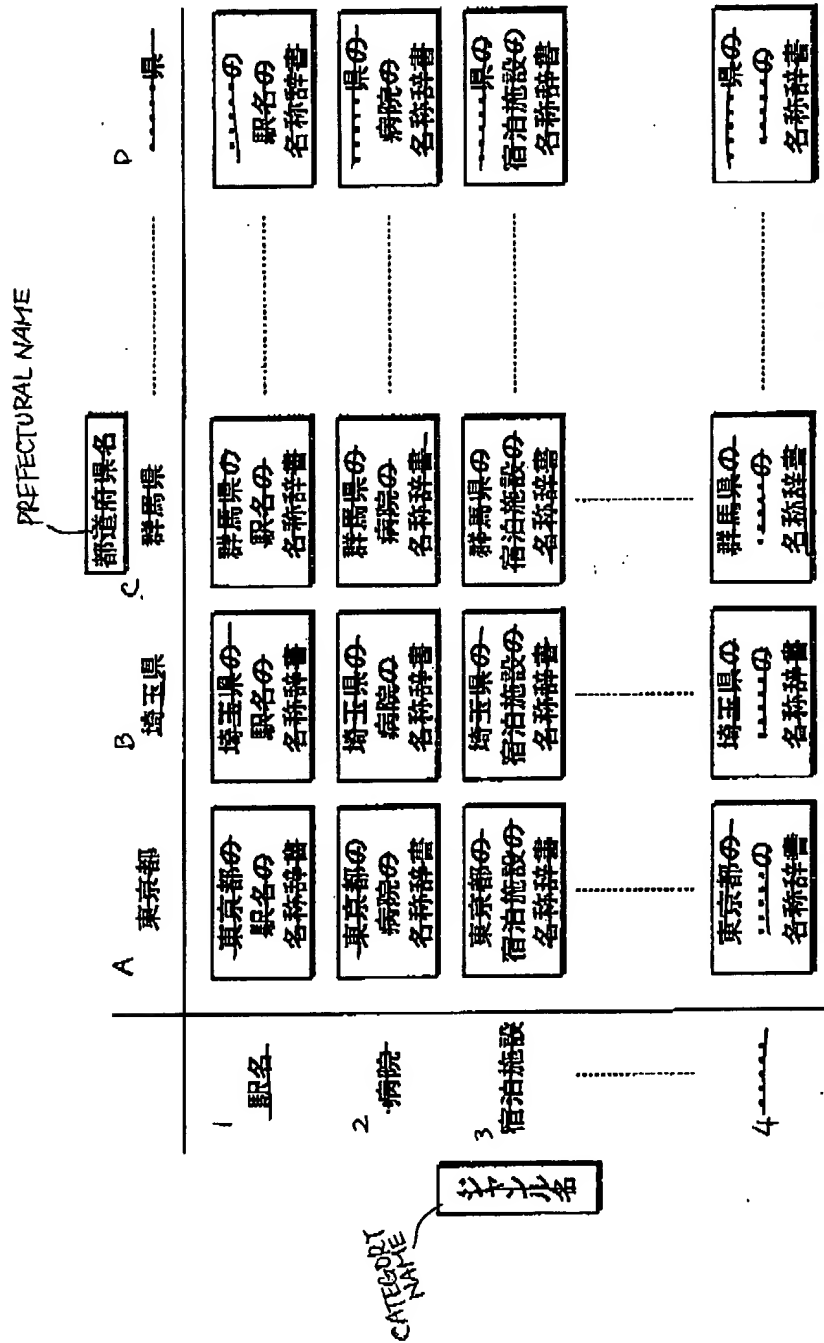
10 END

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(図 9)

Fig. 9



絞り込み条件(都道府県名、ジャンル名)によって区分された施設名称辞書群

Group of institutional name dictionaries classified according to narrowing-down condition such as prefectural name and category name



[FIG. 9]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5 C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10 4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15 A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20 B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25 C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

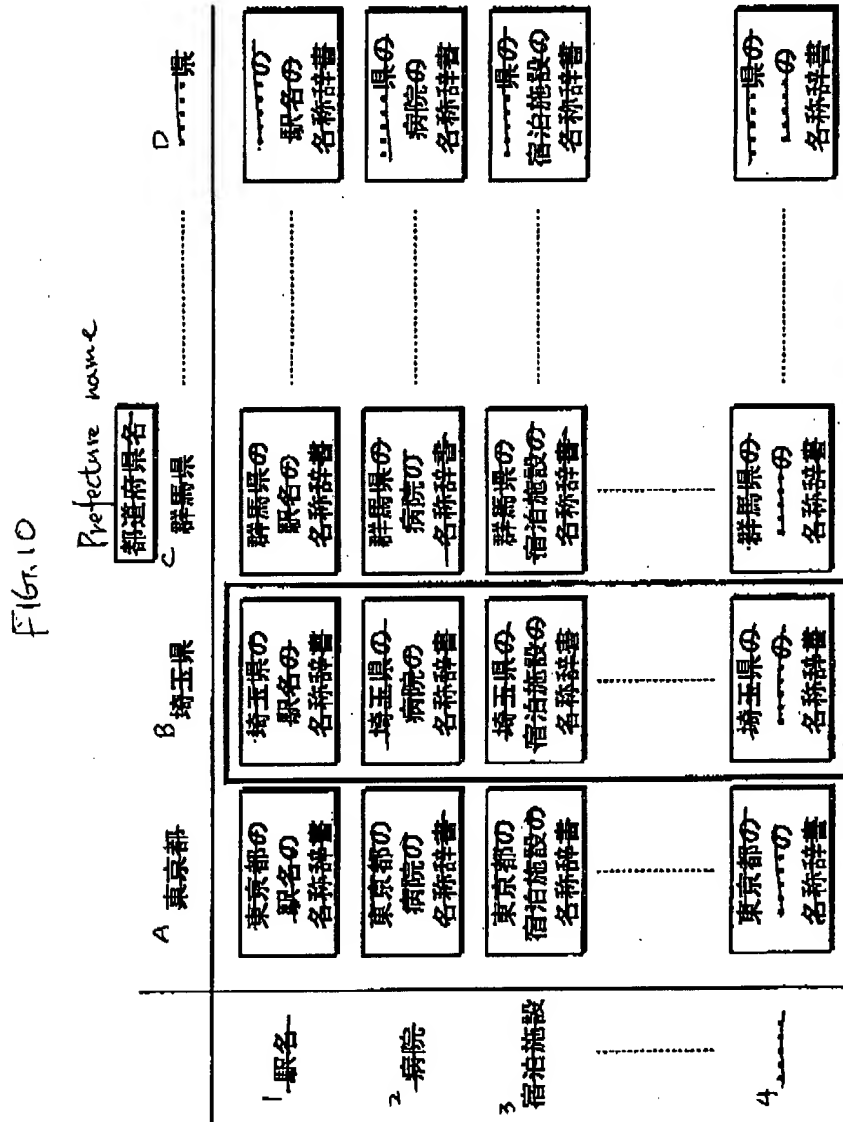
5 D I C T I O N A R Y

D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

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(図10)



初期設定として「埼玉県」が設定された場合に選択される名称辞書郡  
Group of name dictionaries selected in case SAITAMA prefecture is set  
as initial setting.

[FIG. 10]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5 C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10 4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15 A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20 B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25 C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

5 DICTIONARY

D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

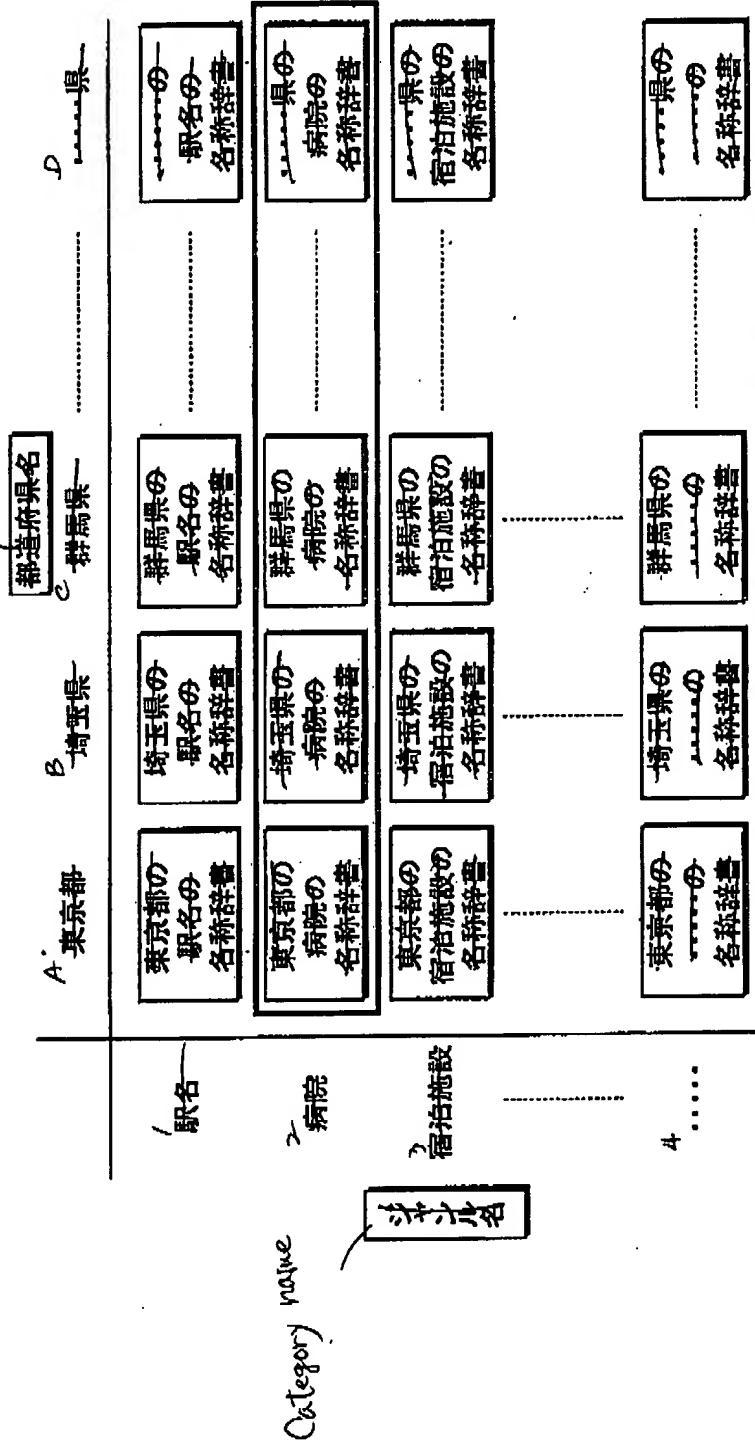
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〔図11〕

Fig. 11

Protective name



初期設定として「病院」が設定された場合に選択される名称辞書郡  
 Group of name dictionaries selected in case hospital is set as initial setting.

[FIG. 11]

A:STATION NAME,

B:HOSPITAL,

C:ACCOMMODATIONS

5    PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

4. SO-AND-SO PREFECTURE

10    (First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

A-4. TOKYO SO-AND-SO NAME DICTIONARY

15    (Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

20    (Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

25    (Fourth row)



D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME  
DICTIONARY

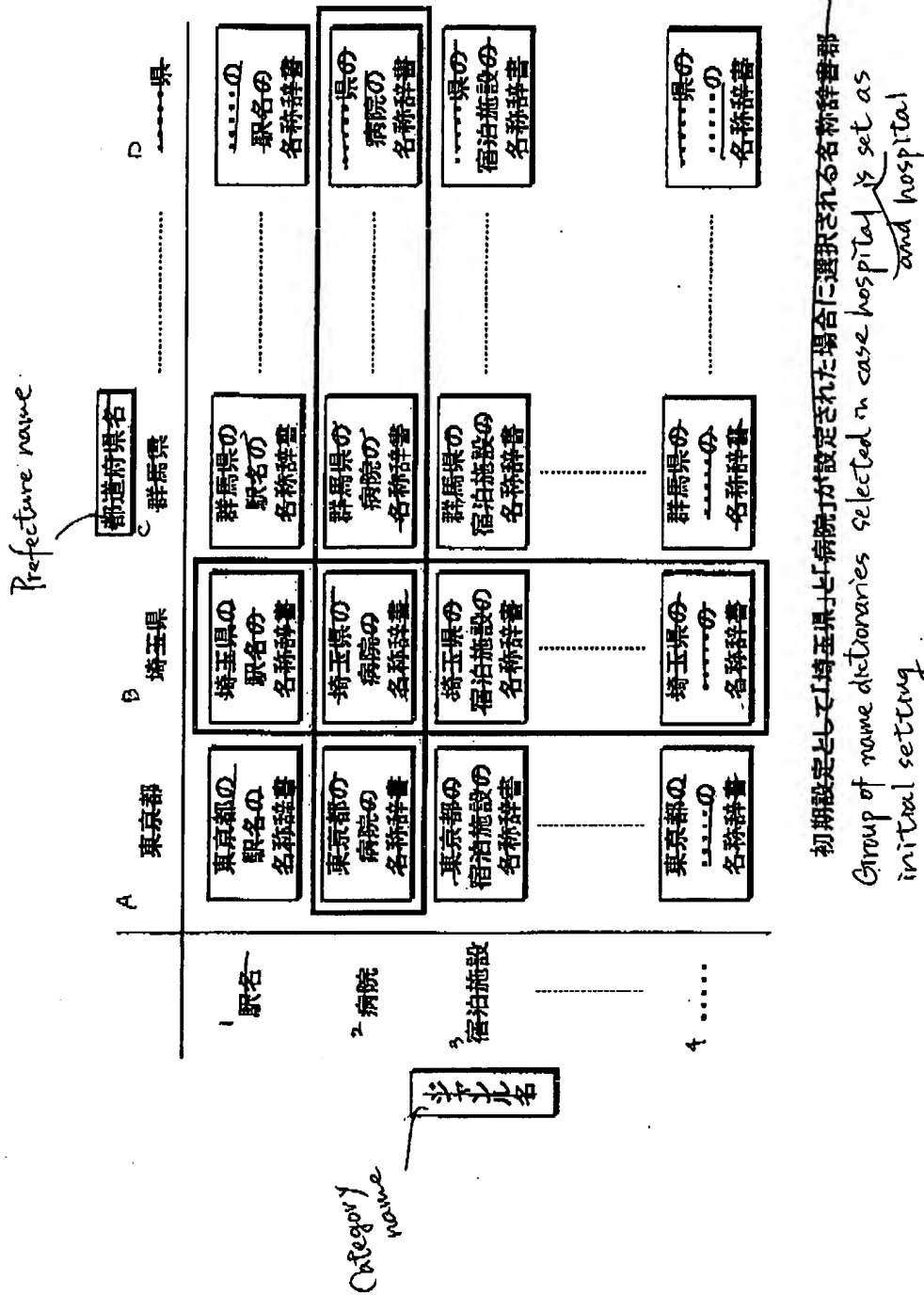
5 D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY



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(図12)



[FIG. 12]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5 C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10 4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15 A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20 B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25 C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

5 DICTIONARY

D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

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【図13】

F16.13

- ① システム: 「ジャンルの名称をどうぞ」
- ② ユーザ: 「教育施設」
- ③ システム: 「次のジャンルの名称をどうぞ」
- ④ ユーザ: 「高校」
- ⑤ システム: 「都道府県名をどうぞ」
- ⑥ ユーザ: 「東京都」
- ⑦ システム: 「市区町村名をどうぞ」
- ⑧ ユーザ: 「渋谷区」
- ⑨ システム: 「名称をどうぞ」
- システム: 「○○学園」

[FIG. 13]

- 1) SYSTEM: "PLEASE VOCALIZE CATEGORY NAME"
- 2) USER : "EDUCATIONAL INSTITUTION"
- 3) SYSTEM: "NEXT CATEGORY NAME, PLEASE"
- 5 4) USER : "HIGH SCHOOL"
- 5) SYSTEM: "PREFECTURAL NAME, PLEASE"
- 6) USER : "TOKYO"
- 7) SYSTEM: "MUNICIPALITY NAME, PLEASE"
- 8) USER : "SHIBUYA WARD"
- 10 9) SYSTEM: "NAME, PLEASE"
- USER : "SO-AND-SO SCHOOL"